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(54) Title of Invention

Water management and treatment system for a urinal

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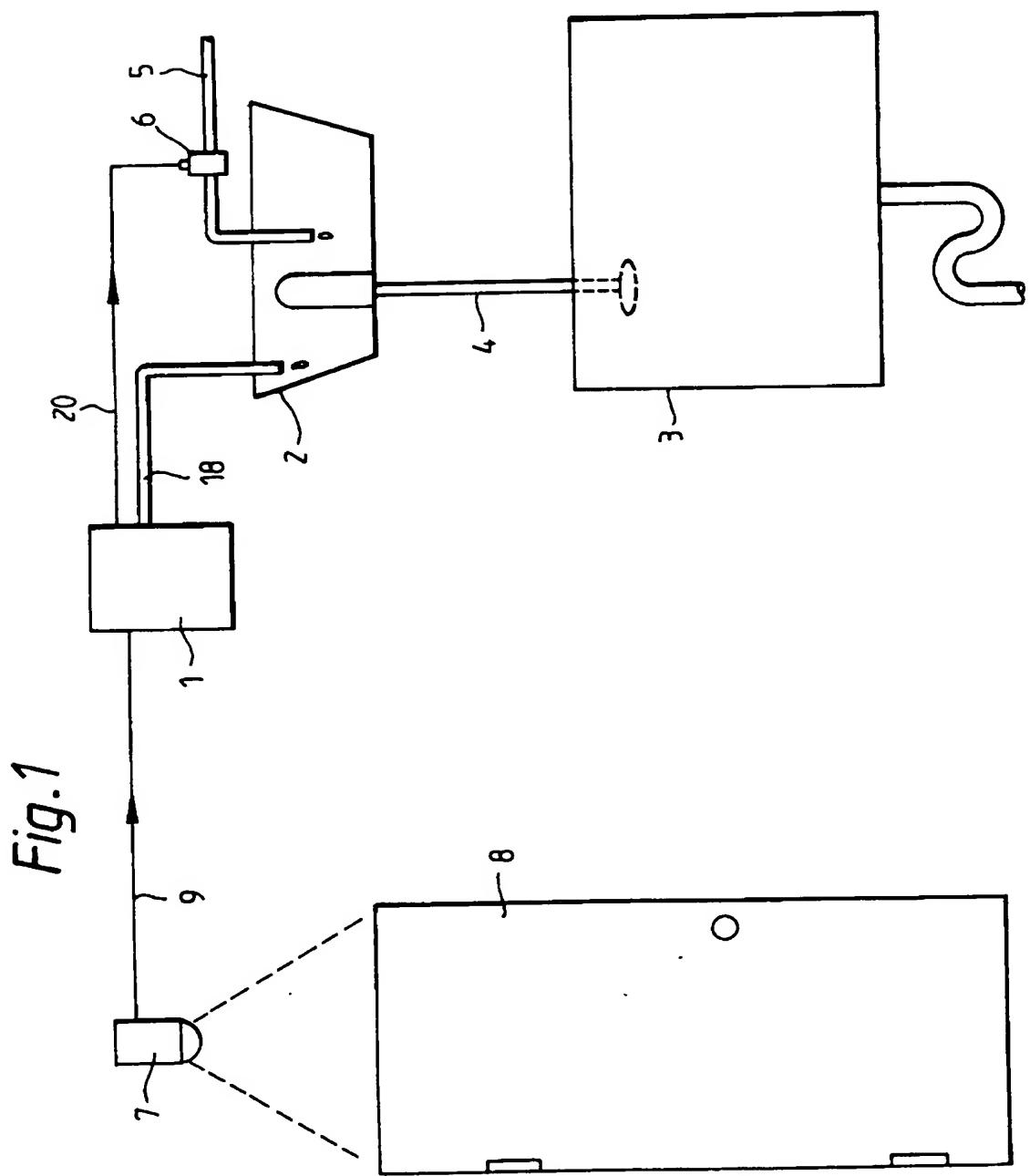
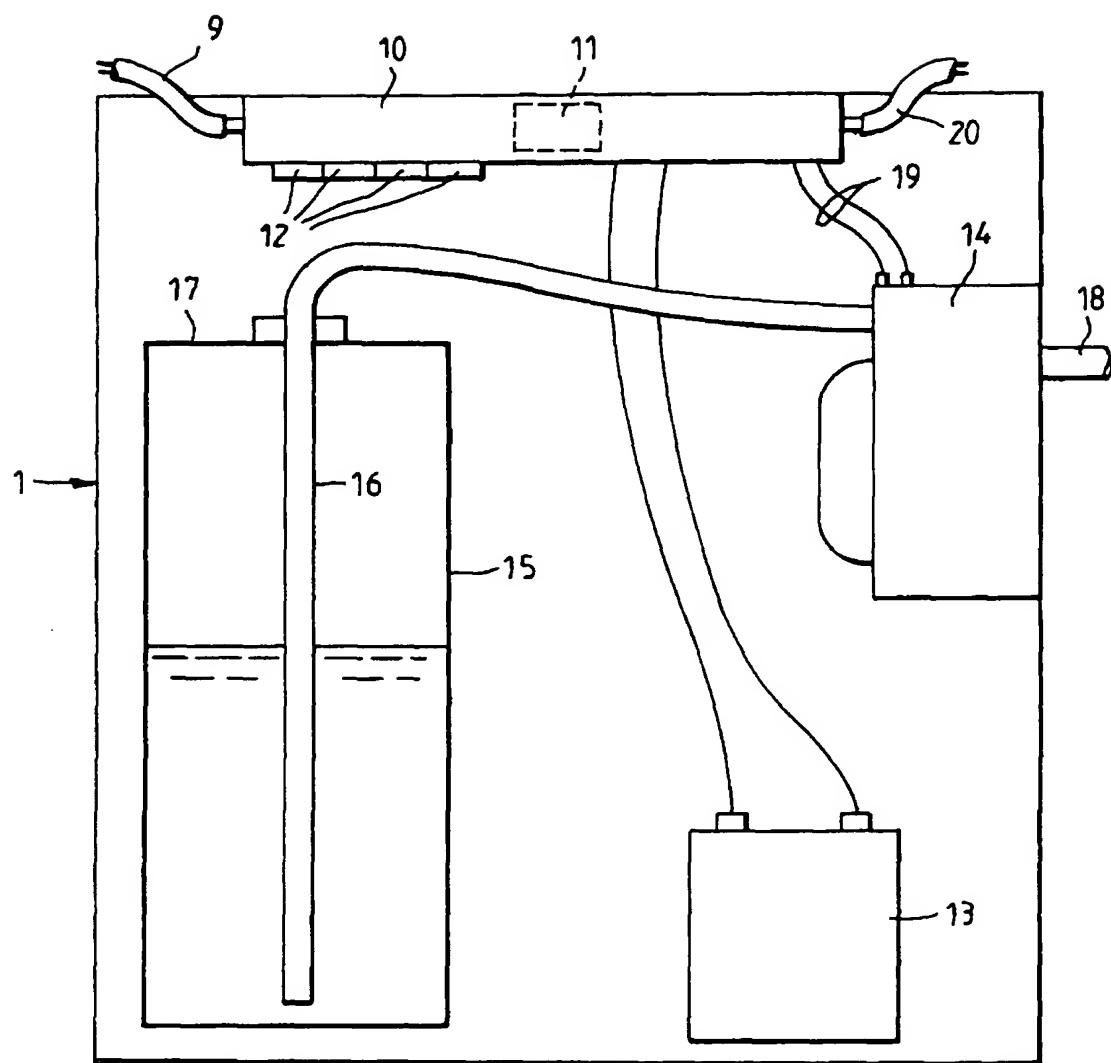


Fig. 2



WATER MANAGEMENT AND TREATMENT SYSTEM FOR A URINAL

This invention relates to water management and treatment systems for a urinal.

Urinals are usually flushed automatically by a pressure-controlled valve connected to the inlet pipe supplying the urinal cistern. Alternatively, the valve can be controlled by a lavatory occupancy sensor such as a passive infra-red sensor. The flushing water can be treated with chemicals such as disinfectants, pipe cleaning chemicals or fragrances. These chemicals are usually in a solid form and are added to the water by diverting a part of the water flow over the solid chemical so that some is dissolved and enters the flushing stream of water.

This form of chemical treatment has several disadvantages. First, it is difficult to control the amount of chemical added to the flushing water; this can lead to insufficient treatment or to overdosing and waste. Second, because the chemical is in solid form, this limits the range of chemicals that can be used and can prevent the use of a more suitable liquid chemical.

It is an object of the present invention to provide an improved water management and treatment system.

According to one aspect of the present invention there is provided a water management and treatment system when used in flushing a urinal, the system including chemical dosing means having a reservoir containing a water treatment chemical, means connecting an outlet of the reservoir to a cistern, valve means for controlling water flow to a urinal and control means for controlling operation of the valve means, and the control means being also connected to the dosing means such that chemical is added from the reservoir to the contents of the cistern in response to operation of the control means.

The water treatment chemical is preferably a liquid and the dosing means includes a pump. The control means preferably includes an occupancy sensor, such as a passive infra-red sensor, the control means controlling operation of the valve means and dosing in response to an output from the sensor. The control means may be arranged to be unresponsive to an output from the occupancy sensor within a predetermined time after operation of the valve means. The control means may include a timer, the control means controlling operation of the valve means and dosing after predetermined time intervals. The chemical is preferably a disinfectant, fragrance or pipe treatment chemical.

A water management and treatment system for a lavatory will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 shows the system installed in a lavatory;
and

Figure 2 shows a control unit of the system in
greater detail.

The system includes a control unit 1 mounted on the wall of the lavatory above a cistern 2 supplying flush water to urinals 3 (only one of which is shown) via a pipe 4. Water is supplied to the cistern 2 via an inlet pipe 5 having a solenoid valve 6 controlling flow along the pipe.

The system also includes an occupancy sensor 7, which can take the form of a passive infra-red sensor located to sense anyone entering through the door 8 of the lavatory. The sensor 7 is connected by a wire 9 to an electrical control circuit 10 within the unit 1. The circuit 10 includes a timer 11 and several user-settable switches 12 for setting the time functions of the circuit. A battery 13 supplies power to the circuit 10. Alternatively, the unit 1 could include a transformer and be powered from a mains supply. The unit 1 also contains chemical dosing means comprised of an electric pump 14 and a chemical reservoir 15 in the form of a removable bottle of a liquid treatment chemical. The chemical could be a disinfectant, fragrance or pipe treatment (eg. descaling) chemical or any combination of these. A feed tube 16 extends through a lid 17 of the bottle 15 to the inlet of the pump 14. An outlet pipe 18 extends from the pump 14 externally of the unit 1 and opens into the cistern 2. Operation of the pump 14 is controlled by the circuit 10 to which it is connected by wires 19.

The control unit 1 is also connected by wires 20 to control operation of the solenoid valve 6.

In operation, the sensor 7 supplies a signal to the circuit 10 when anyone passes within its field-of-view. This causes the circuit 10 to supply a signal along wires 20 to open the valve 6 for a predetermined time as set by the switches 12. At the same time, the circuit 10 supplies power to the pump 14 via wires 19 so that it pumps a dose of liquid from the bottle 15 into the cistern 2, the quantity of which is determined by the pumping time as set on switches 12.

Water flows out of the pipe 5 into the cistern 2 until it reaches its siphon level at which the contents of the cistern are discharged via the pipe 4 to flush the urinals 3 with the chemically-treated water.

The control unit 1 is preferably set so that it is unresponsive to an output from the occupancy sensor 7 caused by entry of another person into the lavatory within a predetermined time, as set by the switches 12. Thus, if the response time were set at five minutes, the urinals 3 would only be flushed in response to someone entering the lavatory after the lapse of five minutes following the previous flushing. The control unit 1 may also be set to flush automatically at predetermined time intervals even if no one enters the lavatory. Thus, the system might be set to flush with treated water every six hours so that the urinals are flushed occasionally when not in use. This also provides a back-up flushing capability in the event that the sensor 7 should fail or become disconnected.

It will be appreciated that the control unit could be modified in various ways. For example, the water could be treated with chemical only once every several flushes, if desired. Different forms of occupancy sensor could be used, such as, for example pressure pads, door opening sensors or a light switch operation sensor.

CLAIMS

1. A water management and treatment system when used in flushing a urinal, wherein the system includes chemical dosing means having a reservoir containing a water treatment chemical, means connecting an outlet of the reservoir to a cistern, valve means for controlling water flow to a urinal and control means for controlling operation of the valve means, and wherein the control means is also connected to the dosing means such that chemical is added from the reservoir to the contents of the cistern in response to operation of the control means.
2. A system according to Claim 1, wherein the water treatment chemical is a liquid, and wherein the dosing means includes a pump.
3. A system according to any one of the preceding claims, wherein the control means includes an occupancy sensor, and wherein the control means controls operation of the valve means and dosing in response to an output from the sensor.
4. A system according to Claim 3, wherein the occupancy sensor is a passive infrared sensor.
5. A system according to Claim 3 or 4, wherein the control means is arranged to be unresponsive to an output from the occupancy sensor within a predetermined time after operation of the valve means.

6. A system according to any one of the preceding claims, wherein the control means includes a timer, and wherein the control means controls operation of the valve means and dosing after predetermined time intervals.
7. A system according to any one of the preceding claims, wherein the chemical is a disinfectant, fragrance or pipe treatment chemical.
8. A water management system substantially as hereinbefore described with reference to the accompanying drawings.